NON-PUBLIC?: N
ACCESSION #: 9508210171
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Vogtle Electric Generating Plant - Unit 1 PAGE: 1 OF 4

DOCKET NUMBER: 05000424

TITLE: DUAL UNIT REACTOR TRIP DUE TO LIGHTNING STRIKES
EVENT DATE: 07/23/95 LER #: 95-002-00 REPORT DATE: 08/18/95

OTHER FACILITIES INVOLVED: VEGP UNIT 2 DOCKET NO: 05000425

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Mehdi Sheibani, Nuclear Safety
and Compliance TELEPHONE: (706) 826-3209

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On July 23, 1995, at 1803 EDT during a severe thunderstorm, multiple lightning strikes occurred in the immediate vicinity of the plant site with at least one direct lightning strike on the plant. Twenty-one of fifty-three reactor control rods on Unit 1 and all control rods on Unit 2 dropped into the cores. Approximately 1.5 seconds later, both reactors received a trip signal for low pressurizer pressure. The reactor trip breakers opened, dropping the remaining Unit 1 control rods. The main turbines tripped, the main feedwater systems isolated and the auxiliary feedwater systems actuated as expected. Control room personnel responded to transition the plant to stable operation in Mode 3 (hot standby).

The cause of this event was voltage surges in the rod control systems of both units. Voltage surges, initiated by the lightning strikes, affected low voltage circuitry in both rod control systems, causing some of the control rod drive mechanisms (CRDMs) on Unit 1 and all CRDMs on Unit 2 to

lose power to stationary gripper coils. This allowed the control rods to drop into the core and both reactors immediately went subcritical. Continued steam demand from the main turbines caused temperature and pressure in the reactor coolant systems to lower until both units tripped on low pressurizer pressure. An evaluation of the rod control systems susceptibility to voltage surges (particularly those induced by lightning strikes) and proposed corrective actions are expected by October 1, 1995.

END OF ABSTRACT

A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.73 (a)(2)(iv) because unplanned actuations of the reactor protection systems (RPS) occurred.

B. UNIT STATUS AT TIME OF EVENT

At the time of this event both Unit 1 and Unit 2 were operating in Mode 1 (power operation) at 100 percent of rated thermal power. There was no inoperable equipment that contributed to the occurrence of this event.

C. DESCRIPTION OF EVENT

On July 23, 1995, at 1803 EDT during a severe thunderstorm, multiple lightning strikes occurred in the immediate vicinity of the plant site with at least one direct ligntning strike to the plant. Twenty-one of fifty-three reactor control rods on Unit 1 and all control rods on Unit 2 dropped into the cores. Approximately 1.5 seconds later, both reactors received a trip signal for low pressurizer pressure. The reactor trip breakers opened, dropping the remaining Unit 1 control rods. In the control room, personnel witnessing the dual unit trip saw both main turbines trip, the main feedwater (MFW) systems isolate, and the auxiliary feedwater (AFW) systems actuate as expected. They throttled AFW to maintain steam generator water level and prevent excessive reactor coolant system cooldown. At 1825 EDT, the Unit 1 turbine driven AFW pump (TDAFWP) was stopped, and at 1835 EDT, the Unit 2 TDAFWP was also stopped.

On Unit 1, MFW regulating valve 1FV-520 would not fully close. Additionally, control rod H2 appeared to drop into the core more slowly than the other rods as seen from the digital rod position indicator (DRPI). On Unit 2, main steamline radiation monitor 2RE-13121 high alarm and trouble alarms were received.

These abnormal indications and alarms did not prevent personnel from making a timely transition from full power to stable operation in mode 3 (hot standby). Several non-safety related failures and abnormal indications were either experienced during the transient or were found afterwards, but did not have a significant affect on trip recovery and are not listed here.

D. CAUSE OF EVENT

The root cause of this event was voltage surges in the rod control systems of both units. Voltage surges, initiated by the lightning strikes, affected low voltage circuitry in both rod control systems. Overvoltage protection circuits in two 24 volt DC power supplies on Unit 1, and ten 24 volt DC power supplies on Unit 2 had activated to turn off the power supplies. As a result, 21 of the 53 control rod drive mechanisms (CRDMs) on Unit 1 and all CRDMs on Unit 2 lost power to stationary gripper coils. This allowed the control rods to drop into the core and both reactors immediately went subcritical. Continued steam demand from the main turbines caused temperature and pressure in the reactor coolant systems to lower until both units tripped on low pressurizer pressure.

An investigation of the Unit 1 trip-related problems found a threaded stud in the globe valve cage of 1FV-520, preventing it from fully closing. Based on an historical review of work activities and the system layout, this is believed to have been left in the piping from original construction and recently moved into a position that restricted valve movement. A review by instruments and controls (I&C) personnel of the slow rod drop determined that an indicator problem existed in DRPI and that control rod H2 had operated properly. On Unit 2, an investigation of radiation monitor 2RE-13121 found no cause for the actuation of its high alarm and trouble alarm. Following troubleshooting, all of the above listed components were returned to service.

E. ANALYSIS OF EVENT

Both units tripped as designed on low pressurizer pressure because of multiple dropped control rods. AFW actuated to supply cooling water to the steam generators and operators responded properly to throttle AFW flow. Problems that arose following the trip were analyzed anomalies that did not prevent operators from transitioning the plant to stable operation in Mode 3. Based on these considerations, there was no adverse affect on plant safety or on the health and safety of the public as a result of this event.

F. CORRECTIVE ACTIONS

An evaluation of the rod control systems susceptibility to voltage surges (particularly those induced by lightning strikes) and proposed corrective actions are expected by October 1, 1995.

G. ADDITIONAL INFORMATION

1) Failed Components:
None

2) Previous Similar Events:
LER 50-424/1988-025, dated 8-29-88.
This 1988 LER resulted in an upgrade of the lightning protection system, especially for the CRDM power system. However, it was insufficient to prevent the loss of power that occurred on July 23, 1995.

3) Energy Industry Identification System Code:
Reactor Coolant System - AB
Control Rod Drive System - AA
Main Feedwater System - SJ
Auxiliary Feedwater System - BA
Lightning Protection/Plant Grounding System - FC
Radiation Monitoring System - IL

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J. D. Woodard
Senior Vice President The southern electric system

August 18, 1995

LCV-0650

Docket No. 50-424
50-425

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Ladies and Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
LICENSEE EVENT REPORT
DUAL UNIT REACTOR TRIP DUE TO LIGHTNING STRIKES

In accordance with the requirements of 10 CFR 50.73, Georgia Power Company (GPC) submits the enclosed report associated with an event which occurred on July 23, 1995.

Sincerely,

J. D. Woodard

JDW/TEW/AFS

Enclosure: LER 1-95-02

cc: Georgia Power Company
Mr. J. B. Beasley, Jr.
Mr. M. Sheibani
NORMS

U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
Mr. L. L. Wheeler, Licensing Project Manager, NRR
Mr. C. R. Ogle, Senior Resident Inspector, Vogtle

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